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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LAM, CATHY FONG FONG	

ART UNIT	PAPER NUMBER
1794	

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07/24/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/816,132	BRIST ET AL.	
	Examiner	Art Unit	
	Cathy Lam	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 30-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-18 and 30-43* is/are rejected.

7)☒ Claim(s) *4,5,14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4-29-2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

In view of the amendment and remarks filed on April 29, 2008, the pending claims are unpatentable as following:

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 29, 2008 has been entered.

Claim Rejections - 35 USC § 112

2. Claims 1, 1, 8, 10, 30, 33, 40 and 41 are rejected under 35 U.S.C. 112, **second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 10, 30 and 40, it is vague and indefinite as to what is “the normal operating temperatures”?

In claims 8 and 40, it is structurally indefinite as to where “a signal layer” is located?

In claim 30, the phrase “….. and part of the visible surface overlaying the thermochromatic material adjacent the carrier substrate” is vague and indefnite, as it is structurally unclear.

in claim 33, applicant is claming an activation temperature range, which is from 30°F - 200°F (or -1°C - 93°C), this range is unrealistic since it covers from a freezing point to a almost boiling point temperature.

In claim 41, line 6 "a solder layer" is indefinite. Furthermore, phrases like "a means for producing a visible change" and "a means for observing said visible change" are indefinite, as there is no clear stated in the disclosure what such "means" are referring to. Clarification is required.

3. Claims 7-8, 17-18, 40 and 42 are rejected under 35 U.S.C. 112, **first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support of the thermochromatic material and the solder mask material being mixed together to form a single mixed layer disclosed in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 6-9, 10-13, 16-18 and 30-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnaud et al (US 6872453) or Larson (US 6229514) or Parker (US 4922242).

Arnaud teaches a thermochromatic layer which is associated with electrically conducting layers. The conducting layers are connected to supply of electricity (or power) for heating up by resistance heating (col 5 L 56-58 & col 6 L1-4).

The thermochromatic layer responses the heat generated by the conducting layers and switch to its reflecting or absorbent state when required (col 6 L 4-6).

Arnaud teaches that the switching temperature of the thermochromatic layer **can be set** by regulating the electrical supply which is regulated by electronic means. Arnaud has set the switching temperature from around 30°C to 40°C (i.e. 86°F-104°F) (col 6 L 41-46).

Arnaud teaches a structure of a substrate, conducting layer and a thermochromatic layer, in the named order. Futhermore, a barrier layer such as SiO_2 can be inserted between the conductive layer and the thermochromatic layer (col 6 L 63-66). Other organic or inorganic layers can be glazed on or under the thermochromatic layer (col 7 L 1-31). The examiner takes the position that this barrier layer and/or this glazing layer resembles the claimed solder mask layer.

The thermochromatic layer which is formed from vanadium oxide gives visual effect when heated (col 5 L 66-col 6 L 6).

Larson discloses a display comprised of a substrate (10), electrode patterns (4,5) and a visualization medium (8); all in the named order.

The visualization medium (8) is temperature sensitive and changes color upon heating of the electrodes (col 5 L 10-17). The electrodes are connected to control units

(e.g. integrated driving circuits) (col 4 L 49-53). The visualization medium transforms a spot heat to a visible dot (9), the examiner takes the position that this is analogous to the identification markings as stated in claim 9.

The examiner takes the position that the electrodes on the substrate resembles the heat generating component on a printed circuit board and the visualization medium resembles the thermochromatic coating. The thermochromic coating is opaque at room temperature but becomes transparent when heated (col 6 L25-29). The thermochromatic material can be a liquid crystal material (col 6 L 30-33).

Parker discloses a thermochromatic material coated substrate comprised of electrodes, a pigment layer, a transparent substrate, a mask and a thermochromatic material.

Electrodes (122,122') are formed onto both surfaces of the substrate (121) wherein the substrate includes a resistive element (col 3 L 3-34). A mask (7) having a cutout pattern is placed adjacent to the first surface of the substrate (col 2 L 64-68). The thermochromatic material is applied to the second surface of the substrate (Fig. 2). Such that from Fig. 2, the thermochromatic material is placed below the mask (7).

The thermochromatic material can be a liquid crystal polymer (col 5 L 21-23). At the transition temperature, the thermochromatic material changes from opaque white to transparent (col 5 L 38-39).

The examiner takes the position that the electrodes on the resistive element is equivalent to a signal layer on a printed circuit board and the electrodes resemble the

heat generating component. Also, the examiner takes the position that the thermochromatic material is integrated with the mask layer (7).

All three prior art teach a thermochromatic layer that is coated over some electronic components; the thermochromatic layer has visual effect that changes from one color state to another state upon reaching a pre-set temperature.

The prior art however do not teach the visual changes were based on a temperature that is above the “normal operating temperatures”, however applicant has not claimed such “normal operating temperatures”.

According to Arnaud's teaching, the temperature that causes the thermochromatic layer to switch to its reflecting/absorbent state can be set by controlling the supply of electricity to the conductive layers (col 6 L 66 - col 6 L 6).

In view of the prior art teachings, one of ordinary skill in the art would choose a normal operating temperature which would not trigger the thermochromatic layer to react or change color until the temperature reaches an undesired level because such finding involves basic design schemes.

Allowable Subject Matter

6. Claims 4-5 and 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if incorporate into independent claims.

7. The following is a statement of reasons for the indication of allowable subject matter: Applicant in the remarks states different specific formulations of

thermochromatic materials result in different activation temperatures, thus the presently claimed must be tied to the activation temperatures because it is the properties.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cathy Lam/
Primary Examiner, Art Unit 1794